Transportation Consensus Project: Working Paper #2

Preservation and Maintenance Task Force

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TRANSPORTATION CONSENSUS PROJECT: PRESERVATION AND MAINTENANCE OF THE EXISTING TRANSPORTATION SYSTEM

I. INTRODUCTION

Recent transportation funding shortfalls have made it necessary for transportation policy makers to discuss the need to generate new revenues to fund needed construction projects beyond the year 2000. While new systems are certainly required to meet the state's mobility needs into the next century, it is also vital that California's investment in the ***existing transportation system*** first be protected.

In California, we have already built an impressive multi-modal transportation system, consisting of four key elements: state highways, local streets and roads, urban and rural transit and commuter rail systems, and an intercity rail network. To ensure that this system can perform efficiently and effectively, the state must address a significant backlog of deferred rehabilitation projects across all of these modes. At the same time, as the state's population and economy grows, the costs of operating and maintaining the system increases.

In short, we must soon find the additional funds to bring the basic transportation system up to 21st century standards, and we must identify the operating and maintenance funding levels required to keep the basic system running efficiently and safely.

California must maintain its existing transportation system in good operating condition to serve the public and maximize the return on its huge investment of almost $1 trillion (see Table 1). Maintaining the existing transportation system limits the cost of future repairs and minimizes delay or interruptions of service for travelers, commuters, and the delivery of goods. Failure to adequately maintain the system will significantly burden the state's economy due to increased travel times, delay, and the increased cost to move goods.

II. DESCRIPTION OF THE BASIC TRANSPORTATION SYSTEM

California has an extensive transportation system which provides access to essentially everywhere in the state.

The public highway and road system extends 165,000 centerline miles:

- 15,000 miles of state highway routes, which has 49,000 lane miles of freeways
- 15,000 miles of main local arterial streets

- 115,000 miles of other local city streets and county roads
- 20,000 miles of park, forest, and federal public lands roads (largely unpaved)
- 10 major toll bridges

These roadways are supported and maintained from approximately 1,600 public works offices and maintenance facilities distributed around the state. On these highways and roads, California's 20 million licensed drivers operate 17 million private automobiles and 5 million trucks.

The state contains 8,000 miles of railroad lines, mostly owned and operated by four major private railroads and more than 30 short lines. Amtrak operates intercity passenger rail service on 2,500 miles of these railroad lines, running 25 trains per day, serving 70 stops.

The public transit system provides varying levels of scheduled service in urban areas, and at least some service in most rural communities. It provides about 14,000 miles of regular service daily:

- 175 miles of urban rail transit, running 800 vehicles and serving 200 stations
- 500 miles of commuter rail, running 220 vehicles and serving more than 100 stations
- 10,000 buses of all sizes, running more than 13,000 miles on about 1,000 regular routes daily
- 9,000 schoolbuses

This transit system is supported by 10 rail yards and other facilities, 140 bus yards and related facilities, and 500 schoolbus yards.

The value of this system, if it were to be built today, is difficult to estimate and somewhat subjective, because of the high cost of urban rights-of-way. Using recent average construction prices, the replacement cost of the state highway and freeway system is estimated at about $300 billion, the entire local street and road system at about another $300 billion, and all rail and bus transit at about $30 billion. Beyond the value of the public system, private individuals and businesses have invested about $300 billion in the purchase of 17 million automobiles and 5 million trucks registered in the state. As shown in Table 1 on the following page, this investment amounts to $930 billion!

TABLE 1. INVESTMENT IN EXISTING TRANSPORTATION SYSTEM

MODE	EXISTING INVESTMENT
State Highway System	$300 Billion
Local Streets and Roads	$300 Billion
Rail and Bus Transit System	$ 30 Billion
Automobiles	$300 Billion
TOTAL COST =	$930 BILLION

Not all parts of California's transportation system are equally significant; but no part is insignificant. Essentially every mile of highway, street and road is used for some kind of travel every day, except remote mountain roads in winter. Almost all goods move by truck, at least for part of their distribution. The people of California make 150 million trips per day by private vehicle and another 3 million by transit. These trips add up to 260 billion vehicle miles of travel per year statewide -- a little more than 50 percent of it on state highways.

The integrity of the existing system is critical to California's economy. If it is not kept serviceable, property owners would face expenditures of about $2,000 per mile of road per year just to keep up their property access. Those dependent on transit would need to buy and operate a vehicle. The additional auto travel would increase smog emissions, noises, congestion on roads and in parking areas, and consumption of petroleum products. For private vehicle owners, poorly maintained roads increase maintenance and operating costs and increase accident rates (including tort liability), which would certainly cut into economic activity that is dependent on travel -- essentially most activities in today's economy.

The following issues highlight the kinds of tradeoffs that have had to be made and the kinds of external forces that have influenced expenditures for maintenance and operations, and the constraints that have led to deferred maintenance.

On the highway, street and road side:

- local general fund expenditures for streets and roads, for benefits of property access, have had to be substantially cut since Proposition 13 in 1978
- larger, heavier trucks and buses can be shown to contribute more to pavement damage and road standards than they pay in fees
- public agency litigation costs and awards have increased due to structural and geometric deficiencies

- highway construction has gone through "boom and bust" cycles; thus, pavement ages and deteriorates, and comes due for major rehabilitation in similar cycles

- the state statutory formula that distributes fuel tax revenues to cities and counties for road maintenance relies on maintenance cost factors that are currently more than 30 years out of date

- the backlog of deferred local street and road maintenance is building at the same time as a decline in the adequacy of fuel taxes as a revenue base

- various retrofit programs, such as for edge drains, seismic reinforcement, energy efficient lighting, breakaway roadside poles and environmental protection, cut into funding otherwise available for maintenance, rehabilitation and system expansion

- federal and state programs that require local match funds for capital investments typically take funding available for street and road maintenance and yield directly increased deferred maintenance of local streets and roads

- basic roadway maintenance is becoming more expensive because of increased need for work under heavy traffic, or work at night to avoid heavy traffic

- maintenance priorities must be divided between structural deterioration and a smooth-riding surface, and the standards for snow closures, road sweeping, landscape maintenance and litter and graffiti removal compete for available funds

The issues that affect expenditures for transit operations and maintenance are even more complex:

- most urban transit systems are still struggling to recover from a 20-year cycle of disinvestment between 1945 and 1965

- federal operating funds, which were readily available during 1965-1986, have since been continually reduced, at a time when local general funds have become increasingly unavailable since Proposition 13 in 1978

- transit buses and rail cars have been bought in cycles and thus come due for replacement in cycles

- the relationship between transit fares and ridership levels yields maximum revenue at a certain fare level, which may not coincide with efficient

operation or optimal service (i.e., higher fares may generate marginally more revenue, but at the expense of less riders served)

- the major public subsidy base for transit operations in California is the sales tax, which is highly sensitive to economic recession, when good transit service becomes most essential

- while it is not universally accepted that transit use should be the primary means to reduce noise, pollution and congestion, most observers agree that transportation consumers face disincentives to utilize transit services (e.g., the price of gas is at its lowest real level since World War II; many localities require free off-street parking; etc.)

- state and federal programs that require local match funds for capital investments bias the priorities for transit funds that could be used either for operations or service expansion

- the political imperative to provide basic service for those dependent on transit, including persons with disabilities, typically places a burden on operating costs

- labor unions often exert pressure to capture funding increases for transit into the wage base, at the expense of expanded or improved service

- labor work rules inhibit transit management flexibility and increase operating costs

- traffic congestion gets in the way of transit schedule reliability

- school transportation, which requires an even larger subsidy than regular transit service, has been loaded onto many urban transit operators by default, a challenge for transit operators exacerbated by the fact that morning school trips must be superimposed on regular morning peak service

- California's constitution (Article XIX) prohibits the use of gas tax funds for transit operating expenses

- California's historic pattern of suburbanization in most regions causes higher operating costs for transit to serve dispersed housing and jobs patterns

III. REHABILITATION, MAINTENANCE AND OPERATING FUNDING NEEDS OF THE FOUR MODES

The following sections of this report document the existing expenditures of local agencies on operating, maintaining and rehabilitating the state highways, local streets and roads, public transit systems, and intercity rail system. This section also estimates the future unfunded needs for each of these modes, in order to preserve the existing system and forestall degradation in system performance.

A. State Highway System

The following tables illustrate the combined needs for California's state highway system.

TABLE 2. SUMMARY OF HIGHWAY OPERATION AND MAINTENANCE NEEDS

($ in millions)

MODE	EXISTING ANNUAL EXPENDITURES	UNFUNDED ANNUAL NEEDS
HIGHWAYS Maintenance	730.0	45.0[1]
Operations	50.0	75.0
TOTAL =	780.0	120.0

[1] Annual expenditures have historically increased at a six percent per year rate. It is estimated that this pattern will continue.

TABLE 3. SUMMARY OF STATE HIGHWAY REHABILITATION NEEDS

($ in millions)

MODE	EXISTING ANNUAL EXPENDITURES	UNFUNDED ANNUAL NEEDS
HIGHWAYS Highways	250.0	100.0[1]
Bridges	50.0	33.0[1]
TOTAL =	300.0	133.0[1]

[1] These figures represent an annualized cost for a 10-year "backlog" of highway and bridge rehabilitation projects. Caltrans estimates that there are $1 billion in highway rehabilitation projects that need to be completed, and $330 million in bridge rehabilitation projects that need to be completed. If the highway backlog is not addressed, costs are estimated to increase at $70 million per year.

The majority of California freeways were constructed between 1961 and 1972. The average age of the system is approaching 30 years. Government Code section 14529.6 makes "operation, maintenance, and rehabilitation of the state highway system" the first priority for funds from the State Highway Account. In 1977, and again in 1984, funds available for pavement rehabilitation were significantly increased (1973 to 1976 rehabilitation funding averaged $19 million per year; 1976 to 1983 averaged $50 million per year; and, 1983 to 1993 averaged $133 million per year.) While these expenditures have been successful in maintaining the rideability of the system's aging pavement, pavement structural problems have continued to grow. The portion of the state highway system with pavement structural problems has doubled (seven percent to 14 percent) since 1978. These trends indicate the difficulties of maintaining an aging system and the importance of adequate rehabilitation funding.

Additionally, many other parts of an aging highway besides the riding surface require increasing maintenance effort: culverts, fences, landscaping, roadside rests, bridges, signals, lighting signs, etc.

In recent years, the emphasis has moved from construction of new freeways and new lanes to management of the system to increase capacity and reduce delay. The increase in traffic and increase of technologically advanced concepts also increases the requirements for more sophisticated maintenance. Increases in societal problems such as cleanup of graffiti and litter, of environmental requirements such as reduced chemical usage, and of hazardous materials spills have all significantly increased the cost of maintaining a mile of highway. Graffiti cleanup has increased from $200,000 per year four years ago, to an estimated $7 million in 1993-94. Since 1983, the number of hazardous spills has increased from 411 per year, to 985 per year in 1992, and the cost to clean up from $334,000 to $2.16 million per year.

Overall, the maintenance budget of the California Department of Transportation (Caltrans) has grown about six percent per year in "constant dollars." The primary reasons for this growth are increases in inventory (lane miles, acres of landscaping, sound walls, signals, and traffic management facilities) and the increasing age of the system. The yearly cost per citizen for maintenance of California's highway system has remained fairly stable since 1986, at about $23 per citizen. The cost per million vehicle miles of travel is approximately $5,000, or $0.005 per mile travelled.

The continuing change in sophistication of maintenance requirements, combined with new requirements, such as graffiti, and increasing traffic which controls when maintenance can be performed, combined with the increasing age of facilities, indicate an increase in maintenance funds is necessary to simply maintain the existing levels of service.

Maintenance of the state highway system costs approximately $5 per 1,000 miles of vehicular travel, or about $730 million per year. Over 50 percent of these funds are not spent on planned maintenance of physical facilities, but on response-type efforts such as slide

removal, snow and ice, inoperable signals, accidents, hazardous spill cleanup or other efforts to respond to immediate hazards to the traveling public. As traffic volumes continue to increase on existing facilities and more sophisticated hardware is installed to better manage the system, the response type of maintenance effort will also increase.

The Department of Finance estimates California's population will grow 50 percent by 2015. Caltrans estimates traffic volumes will increase 63 percent in the same time period. The historical six percent per year increase for maintenance is a reasonable estimate of future needs, considering the aging system and more complex maintenance requirements.

Operation and system management increases the capacity and quality of the highway system. To maintain or reduce the existing level of congestion, the cost of these operational strategies will have to increase to handle new travel demands and minimize amounts expended for new highway improvements. Operational costs are presently about $50 million per year.

Rehabilitation funding for the existing state highway system has been programmed in 1994 in the $1.0 billion range for the four years 1992-93 to 1995-96. Approximately 425 lane miles (one percent) of the state highway system has a poor ride quality; another 1,600 lane miles have major structural problems. Approximately 11,800 lane miles (24 percent) of the state highway system have minor or major structural problems and/or poor ride quality. Since 1988, approximately 800 lane miles per year, or only 1.6 percent of the system per year, has been rehabilitated.

The existing rehabilitation funding level is only enough to address a portion of the state highway needs, those related to rideability. The pavement structural problems are increasing at a rate of approximately one percent, or 500 additional lane miles a year, at an estimated cost of $70 million a year increase in needs. The unaddressed pavement structural needs are currently $1 billion in backlog, and increasing at a rate of $70 million per year.

State highway bridge needs for replacement or rehabilitation are estimated at $330 million through the year 2001. The Department is currently spending approximately $50 million per year on bridge rehabilitation. Landscaping, rest areas, culverts and pipes and other appurtenances also are underfunded to meet rehabilitation needs.

B. Urban and Rural Local Streets and Roads

The following tables illustrate the combined needs for California's local streets and roads system.

TABLE 4. SUMMARY OF ROADWAY OPERATION AND MAINTENANCE NEEDS

($ in millions)

MODE	EXISTING ANNUAL EXPENDITURES	UNFUNDED ANNUAL NEEDS
STREETS & ROADS Rural	180.0	180.0
Urban	156.9	80.6
TOTAL =	336.9	260.6

TABLE 5. SUMMARY OF ROADWAY REHABILITATION NEEDS

($ in millions)

MODE	EXISTING ANNUAL EXPENDITURES	UNFUNDED ANNUAL NEEDS
STREETS & ROADS	590.3	303.4

This analysis focused on the unique nature of California's streets and roads networks and determined discrete "urban" and "rural" operations, maintenance and rehabilitation needs.

B.1. Rural

Rural counties have historically been heavily dependent upon federal and state revenue sources generally distributed according to protected formulas that did not allow local elected officials discretion to divert the funds to non-road uses. Once restrictions were lifted, social pressures encouraged local elected officials to utilize funds previously restricted for transportation uses for general fund purposes (i.e. traffic fines, motor vehicles in-lieu).

Rural street and road maintenance must be considered in light of a number of unique circumstances. For instance, rural counties continue to be the primary source of California's agriculture, ranch, timber and mineral products and materials. In many instances, roadway locations, width, alignment or structural sections have not significantly changed for 50 to 100 years. They are the backbone of California's food source and raw materials.

Rural counties such as Alpine, Del Norte, Lassen, Modoc, Plumas, Sierra, Siskiyou and Trinity are dependent upon federal forest sales revenues of 45 percent or better for their road budgets. However, changes in philosophy as to national forest use, resulting in significant decrease of forest sales revenues, has dramatically impacted their road maintenance efforts. Ironically, these counties are heavily impacted by seasonal federal lands use, recreation users, and are located in areas susceptible to severe climatic conditions, all of which contributes to and accelerates roadway structural and surface deterioration. The average federal revenues to handle road needs for all 58 counties is 9.5 percent of total revenues (1991 Controller's Report).

Local revenue sources for the rural counties vary from a low of five percent to a high of 20 percent. The average for all counties is 37.5 percent (1991 Controller's Report).

State revenue sources average 53 percent for all counties (1991 Controller's Report). However, Amador, Del Norte, El Dorado, Lassen, Mariposa, Plumas, Siskiyou, Trinity and Tuolumne receive a low of 22 percent to a high of 33 percent of their road funds from state sources. State revenues (gas tax) are distributed based upon vehicle registration, with a limited modification based upon maintained mileage. Total revenue is predicated upon fuel consumption, which is impacted by efficiency advances, miles traveled, and general economic pressures.

Several other issues have been identified with regard to maintaining and operating rural streets and roads, including:

- static and/or decreasing state revenues
- increased material costs
- decreasing federal revenues
- increased equipment replacement costs
- accelerated structural section and/or pavement deterioration
- increased tort cases due to claims of deficient roadways
- reluctance of local taxpayers to increase local funding
- recreational and seasonal traffic places a burden on local operating and maintenance budgets in many areas of the state, whereas no state financing formulas recognize the impact of non-locally generated traffic
- overweight trucks do a great deal of damage to many rural roadways, and may be responsible for a disproportionate amount of the damage to these roads

Many rural agencies note that there are no accepted standards for streets and road maintenance. For instance, a 12′ to 14′ wide one lane road with strategic turn outs may be acceptable to a native of the region, but not to a tourist or newcomer to the community who is used to freeway standards. Similarly, should rural agencies design to a 20-year life, which may require extensive stabilization and deep structural sections, or should they design to a "maintainable level", which may require restoring grade line every year or two due to subsurface slippage? Rural agencies believe that once standards are agreed to and maintenance needs are met, money will become available for rehabilitation in the form of maintenance savings.

In fiscal year 1990-91, $356 million was expended for maintenance on the 58 counties' 68,000 miles of county-maintained roads. In fiscal year 1991-92, $372 million was spent for maintenance on the same mileage. Approximately half this amount was spent by rural cities and counties. Rural counties are limiting rehabilitation and reconstruction upgrading in order to finance routine maintenance as system deterioration accelerates. In general, rural counties believe that maintenance expenditures need to increase 50-100 percent in order to maintain a system, and still continue to rehabilitate and reconstruct to meet current standards. This projection would thus necessitate a funding level increase of approximately $180 million per year. Rural agencies anticipate they will be able to more accurately quantify this need as the use of federally mandated pavement management systems is phased in over time.

B.2. Urban

This section details the current expenditures, needs, and existing backlog for pavement-related maintenance and rehabilitation on local urban streets and roads. The figures presented in Table 4 and Table 5 are based on pavement condition data from 12 jurisdictions in the San Francisco Bay Area and on revenue and expenditure data found in the report *Financial Transactions Concerning Streets and Roads of Cities and Counties of California*, produced annually by the State Controller's Office.

Total street and road revenues and expenditures were obtained from the State Controller's report. Pavement revenues were derived from the total street and road revenues by applying the ratio of past pavement-related expenditures to current total street expenditures. This ratio was further adjusted by expenditure information gathered from the individual cities and counties. The existing expenditure per mile for pavement related maintenance and rehabilitation by Bay Area jurisdictions is $1,017 and $3,825, respectively. These expenditure per mile figures were multiplied by the total number of centerline miles in the state to obtain an annual statewide expenditure of $156.9 million for maintenance and $590.3 million for rehabilitation.

Most cities and counties obtain revenues for street and road purposes from state gas tax subventions, locally generated funds (general fund, fees and fines, bond sales, etc.), and local county-wide sales tax measures. The majority of revenue comes from gas tax subventions (19

percent of street and road revenues for cities and 63 percent for counties in 1993) and locally generated funds (67 percent of street and road revenues for cities and 22 percent for counties in 1993). Both gas tax and locally generated revenues have been relatively flat, or even declining, over the past ten years. This has resulted in shrinking pavement maintenance budgets as inflation, labor and materials costs have grown. The result is that many jurisdictions are facing increasing backlogs of deferred maintenance and that the condition of the state's local streets and roads is deteriorating.

Pavement maintenance and rehabilitation needs were calculated using the Metropolitan Transportation Commission's Pavement Management Software. Current pavement conditions and existing expenditures for 12 Bay Area jurisdictions were entered into the software to produce annual needs, the current backlog of projects, and to project shortfalls. The annual pavement need per mile is an average of pavement needs over the next 20 years. This includes annualizing the existing backlog that has been created by previous funding shortfalls. This annual pavement need per mile also includes an estimate of stop gap maintenance needs and additional costs due to deferring projects due to lack of funds. The annual maintenance and rehabilitation need per mile derived from the Bay Area sample is $2,055 and $7,730, respectively. These figures translate to an annual statewide need of $237.6 million for maintenance and $893.8 million for rehabilitation.

Much of the local street and road network in the state has reached maturity. As the street network gets closer to the end of its design life, the costs of maintaining the pavement increase. This effect is magnified if preventative maintenance is not applied to pavements, because deferring maintenance leads to earlier reconstruction -- and reconstruction is many times more expensive than preventative maintenance. If one looks at the life-cycle costs of maintaining pavements, it is much less expensive to consistently apply preventative maintenance treatments to extend the life of the pavement than to let the pavement deteriorate to the point where it needs complete reconstruction. (Various studies document this fact, including "A Flexible Pavement Maintenance Management System", by Wayne S. Smith of the University of California; and "Your Choice: Bad Roads at High Cost or Good Roads at Low Cost", by M.J.E. Sheflin of the Regional Municipality of Ottawa-Carleton, Canada.) Thus, as more maintenance is deferred, the costs of maintaining the street network increase due to the overall condition of the network deteriorating to the point where cheaper preventative maintenance is no longer effective.

A comparison of annual pavement expenditures and needs yields a shortfall of $80.6 million for maintenance and $303.4 million for rehabilitation. The reasons for this shortfall are many. As described above, revenue for streets and roads has not kept up with inflation. The situation is particularly dire for local jurisdictions since the passage of Proposition 13. Because of relatively flat gas tax revenues, cities and counties have become more dependent on general funds for street and road maintenance purposes. Furthermore, local cities and counties have limited ability to raise revenues through property taxes and face increased demands on general funds for essential services such as police and fire protection.

As revenues have remained flat, pavement maintenance needs have continued to climb. Due to the annual revenue shortfall, many jurisdictions are forced into a "worst first" maintenance strategy. This only accelerates the deterioration of the street network and leads to increasing maintenance costs down the line. Thus, the choice is clear: either pay for road maintenance now, or pay an ever-increasing amount for road maintenance later. Failing to close the annual pavement maintenance shortfall today will inevitably lead to a much greater need for additional revenue in the future.

The trends described above are not new. The annual pavement maintenance shortfall has been around for many years, resulting in a growing backlog of deferred maintenance that now stands at $4.29 billion for the entire state. This backlog consists primarily of rehabilitation projects and could have been much smaller if there were sufficient revenues in the past to adequately maintain local streets and roads. This backlog is the result of a massive funding shortfall, compounded by the inability of many jurisdictions to devote sufficient resources to preventative maintenance -- either due to lack of resources, poor project prioritization, or a combination of both. Unfortunately, this backlog will only continue to grow, resulting in higher user costs (more frequent vehicle maintenance, worse gas mileage, increased shipping costs), growing pavement maintenance costs, increasing costs for cities and counties due to tort liability claims, and declining confidence in government's ability to get things done.

In addition to the revenues needed to close the pavement maintenance shortfall, California also needs to improve the management of its pavements. As stated above, the life-cycle costs of maintaining streets and roads are dramatically increased in the absence of a consistent and timely preventative maintenance program. Pavement management systems can be used to assure that maintenance funds are expended in the most effective manner. Any future revenue enhancements aimed specifically at pavement maintenance should be coupled with a requirement to use a pavement management system in order to be eligible for new revenues. These two strategies -- eliminating the annual funding shortfall and improving the management of the street network -- will bring our streets and roads back into a good state of repair and ensure that scarce public resources are being spent in the most effective way possible. California's local street and road network represents one of our largest public capital investments, one which we cannot fail to protect.

C. Urban and Rural Public Transit

The following tables illustrate the combined needs for California's transit systems.

TABLE 6. SUMMARY OF TRANSIT OPERATION AND MAINTENANCE NEEDS

($ in millions)

MODE	EXISTING ANNUAL EXPENDITURES	UNFUNDED ANNUAL NEEDS
PUBLIC TRANSIT Transit	2,580.7	366.0
Commuter Rail	119.1	0.5
TOTAL =	2,699.8	366.5

TABLE 7. SUMMARY OF TRANSIT REHABILITATION NEEDS

($ in millions)

MODE	EXISTING ANNUAL EXPENDITURES	UNFUNDED ANNUAL NEEDS
PUBLIC TRANSIT Transit	833.9	232.0
Commuter Rail	626.1	0.0
BART Seismic	0.0	36.0[1]
TOTAL =	1,460.0	268.0

[1] This figure represents a total unfunded cost of $180 million annualized over five years.

Local agencies, including cities, counties and special districts, operate and maintain hundreds of public transit systems in California. In the case of urban and commuter rail, local agencies have also made significant investments in rail capital construction. These systems provide mass transit services to millions of Californians, which contribute to increased mobility, improved air quality, and reduced congestion.

Transit systems statewide spent $2.6 billion to operate their basic services in 1992-93. In addition, $834 million in capital expenditures were made in the same year, to purchase rail and bus vehicles, and construct and rehabilitate rail lines and associated facilities.

However, an emerging problem faces local agencies with respect to operating and maintaining the existing transit systems. This problem has three parts:

- the existing system is moving into a deficit due to a declining revenue base
- new federal and state legislation mandating clean air and disabled access is increasing transit operating costs
- new rail service mandated by California's voters increases operating demands

The first component of the problem arises from the slowed growth, and more recently an absolute decline, in revenues available to meet operating costs for transit service providers due to the lingering economic recession. More specifically, public transit has been particularly hard hit because of its large dependence on sales tax revenues for operating purposes. Recent state budget crises have also had an impact on certain municipal transit operators by reducing state subventions to the cities, thereby putting more fiscal pressure on local support to transit. This loss of revenue has had a particularly severe impact on rural transit agencies. Rural systems generally operate with marginal ridership due to travel distances and low population densities; however, these services are life line services, and represent the only travel option for many citizens.

Transit agencies' response to the deteriorating fiscal situation has been to increasingly "tighten their belts." In many cases, significant service reductions have been or will be implemented. Fare increases have also been used, but for some transit agencies the recession has reduced transit patronage. Fare increases in the face of weakening ridership may result in still fewer riders and little or no additional revenue. In addition, transit serves as a sole source of mobility to many economically disadvantaged citizens who can least afford an increase in fares.

Transit operators are also attempting to control or otherwise reduce costs by deferring critical capital replacement needs, asking labor to moderate or forgo wage and benefit increases rather than eliminate positions, and reducing management overhead.

A second component of the problem, which compounds the effects of the current statewide recession, is the implementation of recent federally mandated programs required by the Americans with Disabilities Act (ADA) and the federal and state Clean Air Acts:

- The recent passage of ADA brings with it significant new capital and operating demands on the state's transit providers. In general, ADA compliance will affect both fixed route accessibility costs and paratransit service costs. Significant amounts of new paratransit service must be added to bring transit service to the eligible disabled in a manner comparable to fixed route service for both bus and rail transit providers.

- The Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) require that transit operators comply with stringent emission regulations through the use of alternative fuels and technologies for transit vehicles -- particularly for heavy-duty engines. While various "low-emission" technologies and alternative fuels appear to be able to bring urban buses into compliance, converting to any one of the emerging technologies will add significantly to the operating and maintenance costs of the state's transit providers. Indeed, nearly every aspect of bus operations will be affected including the requirement for new maintenance and fuel facilities, vehicle capital costs, route scheduling and planning, safety, training, fuel costs and maintenance costs.

Furthermore, the operating requirements associated with these mandates -- complying with clean air and accessibility requirements -- have been legislatively imposed without corresponding sources of revenue with which to offset the operating and capital cost impacts. Operators cannot, in the case of clean air and accessibility mandates, reduce or defer expenditures, as they could in the case of declining revenues due to an economic recession.

A final component of the financial problem facing transit operators results from the expansion of rail transit. California voters in June 1990 approved three transportation funding measures (Propositions 108, 111 and 116) which provided a significant increase for rail capital funding. Implementing these rail projects creates an increased demand for operating funding which, in some cases, may be beyond what fare revenues and other local revenues can provide. While the capital support is critically needed to expand rail systems, the operating funding shortfall will be exacerbated.

The financial impacts of complying with federal and state clean air standards, Americans with Disabilities Act requirements and implementing rail bond projects are significant. These incremental financial needs are in addition to the capital and operating shortfalls that are projected to occur in operating and recapitalizing the existing transit system and services by the year 2000. The state's existing transit system is expected to be in deficit by $756 million by fiscal year 1999-2000. This is a result of a combination of service growth to meet increased demand and a declining revenue base. The rail bond projects collectively will require approximately $570 million in non-fare operating revenues through fiscal year 1999-2000 to finance their operations, and an additional $1,293 million in capital funds to complete needed construction and rehabilitation on the existing system.

In addition to these basic system costs, the estimated annual costs associated with meeting clean air standards for diesel bus emissions and the costs of complying with ADA are as follows:

- Clean Air Compliance -- The costs of complying with clean air requirements vary based on the technology chosen and the size of the bus fleet operated by the transit provider. The cost is estimated conservatively at $104.2 million

annually. These full compliance costs will not be fully realized until fiscal year 1995-1996. The cumulative cost by the year 2000 is estimated to be $686 million.

- Americans With Disabilities Act Compliance -- Annual incremental costs associated with ADA compliance will be $126.7 million. As with the compliance costs associated with clean air requirements, these full costs will not be realized immediately, but will escalate up to fiscal year 1995-1996. The cumulative cost by the year 2000 is estimated to be $827 million.

Several regional agencies also operate and maintain commuter rail lines. These "heavy rail" services provide longer-haul trips in San Diego, the five-county Southern California region, and in the San Francisco Bay Area. These agencies are currently spending a combined $120 million per year to operate and maintain these systems. Based on existing "minimum system" expansion plans, this figure will need to be increased by $500,000 annually.

A final, somewhat unique rehabilitation need faces one of the state's major urban transit systems. Based on the latest knowledge gained from the 1994 Northridge earthquake, it is now apparent that the Bay Area Rapid Transit District (BART) system must upgrade its physical facilities to meet these higher standards.

In fact, BART's extensions are being built to these new, more stringent standards. BART has proposed that the entire existing system be brought up to these new standards as well. This would be a major undertaking, with a current cost estimate of $180 million in 1993 dollars.

D. Intercity Rail System

The following tables illustrate the combined needs for California's intercity rail systems.

TABLE 8. SUMMARY OF INTERCITY RAIL OPERATION AND MAINTENANCE NEEDS

($ in millions)

MODE	EXISTING ANNUAL EXPENDITURES	UNFUNDED ANNUAL NEEDS
INTERCITY RAIL	33.5	10.0[1]

[1] Intercity rail operations are subject to annual appropriation through the budget process. "Unfunded Annual Needs" reflects the costs over the baseline amount projected in the 1993 Rail Passenger Program Report.

TABLE 9. SUMMARY OF INTERCITY RAIL REHABILITATION NEEDS

($ in millions)

MODE	EXISTING ANNUAL EXPENDITURES	UNFUNDED ANNUAL NEEDS
INTERCITY RAIL	62.2	45.0[1]

[1] Existing expenditure based on funded program over 10 years as identified in the 1993 Rail Passenger Report. "Unfunded Annual Needs" is based on the AB 973 projection. This does not include costs to increase speeds in current services to 110 mph and above.

Intercity rail routes operate largely between several regions of the state. Services for these routes are planned and administered at the state level. Local and regional planning agencies are encouraged to share their ideas and concerns regarding service to their respective areas. All state-supported intercity rail services in California are operated by Amtrak under the provisions of Section 403(b) of the Federal Rail Passenger Service Act.

Caltrans intercity services are components of the state's overall transportation system. Services intended to meet primarily local needs are developed as commuter and urban rail services rather than intercity.

The state and Amtrak each pay a portion of the operating costs of state-supported intercity rail services. The state pays for capital improvements to intercity rail services primarily through its state rail bond programs and Transit Capital Improvement (TCI) Program. Under these programs, the state pays up to 100 percent of the project costs of intercity rail capital improvements.

There are currently three state-supported intercity passenger rail corridors: *San Diegans*, *San Joaquins* and the *Capitols*.

The *San Diegan* route presently extends 231 rail miles between Santa Barbara and San Diego. The *San Joaquin* route presently extends 312 miles between Oakland and Bakersfield. The *Capitol* route extends 152 rail miles from Roseville to San Jose.

If state support for the intercity rail passenger services were not provided, all service on the *San Joaquin* and *Capitol* corridors would immediately be suspended by Amtrak. Ridership and revenues are higher on the *San Diegans* than on the other two corridors, but even that service may be reduced to offset Amtrak's increased costs.

Failure to adequately maintain right-of-way increases the likelihood of train derailment due to rolled or spread rail. It also reduces ride quality. Additionally, failure to fund track and/or signal upgrade programs eliminates any significant speed or track capacity increases.

Amtrak's equipment pool consists of 450 locomotives and 1,798 passenger cars. The locomotives are, on average, 20 years old, while the average age of their passenger cars is 22 years old. The average age of the newest cars, representing about six percent of the fleet, is five years; however, the oldest cars, representing 41 percent of the fleet, average 33 years. Amtrak's financial condition has affected its ability to properly maintain its aging fleet. As a result, about 40 percent of its cars are past due for heavy overhauls. Additionally, cars and locomotives damaged in derailments last year have placed increased demands upon the entire fleet -- demands Amtrak cannot always fulfill as exemplified by a recent temporary suspension of checked baggage service on the *San Diegans* due to lack of equipment.

Amtrak's equipment shortage has prevented implementation of new services and constrained its ability to operate more marketable schedules.

Amtrak is attempting to negotiate new agreements with each of the freight railroads at this time (negotiations were recently broken off by Santa Fe). These new contracts will likely increase operating costs to Amtrak and the and the state, since all three state-supported intercity corridors are operated on freight railroad rights-of-way. The increased costs may be incurred in the areas of higher on-time performance incentive payments, increased share of the cost of maintaining the rights-of-way and higher facility lease payments.

One of the most significant challenges facing expanded and continued operation of existing passenger rail services in California is the lack of a secure and stable funding source. Capital improvements have relied on the passage of rail bonds and a dwindling Transit Capital Improvement Fund as sources of revenues. The defeat of Proposition 156 in 1992 and Proposition 181 in 1994 and the resulting deferment and possible elimination of projects threatens the state's ability to expand services and maintain existing infrastructure in the future to operate existing services. Without a stable funding source, reliable plans cannot be made, nor agreements reached with the railroads.

Minimum investment in the existing system on currently defined corridors is $173.5 million.[1] This includes $33.5 million as the state's share of the projected annual operating loss; $15 million to make all stations ADA-compatible, as well as to raise platforms to a level eight inches above the top of rail platforms; $52 million as the state's share to design and construct the Lick rolling stock maintenance facility; and, $73 million for track and signal improvements on the *Capitol* and *San Joaquin* corridors.[2] This does not provide any capital funds for track and signal improvements needed for expanded levels of services.

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[1] The operating and capital costs of all intercity services may be impacted as Amtrak renegotiates its operating contracts with the freight railroads, due to expire in 1996.

[2] Total funding for the Lick Maintenance Facility includes: TCI -- $20.5 million; Proposition 108 -- $221.9 million; Proposition 116 -- $9.1 million; Local -- $10 million; Amtrak -- $1.5 million; and Federal -- $36.2 million, totalling $99.2 million.

Existing level of service is defined as ten daily round trips on the *San Diegans* (including three Santa Barbara and one San Luis Obispo extensions); six daily round trip *San Joaquins* (including connecting service between Sacramento and Stockton); and, six *Capitols* (including extending one train to Colfax). This service level reflects the current operations and longstanding service level commitments.[3]

These planned service expansions are predicated upon-in house analysis, including ridership projections, or studies directed by the Legislature (i.e., the ACR 132 Report).

Capital investments required to implement the increased services are based on proposals developed by the host railroads and analyzed by Caltrans and Amtrak.

Amtrak is currently operating Amfleet equipment on the *San Diegans*. These cars are nearly 20 years old, in relatively poor mechanical condition, and are not easily accessible to the handicapped community. In order to ensure continued growth in the corridor by providing reliable services that are user-friendly, Amtrak's entire fleet of 54 cars should be replaced with the California Car. The estimated cost of replacement, based on the 1992 contract price, is $170 million. It will also become necessary to replace all of the Horizon equipment operated by the *Capitol* and *San Joaquin* corridors. The cost to replace those cars is nearly $67 million.

Within the next two years, California will take delivery of 66 new bi-level intercity passenger cars and 10 locomotives. This represents a $164 million investment. In order to protect this investment, each car and locomotive must be maintained to higher standards than currently applied to Amtrak-owned equipment. The current Amtrak equipment maintenance facility in the Bay Area, where many of the cars were to be maintained, must be relocated due to the Cypress Freeway Project. The state will soon sign a Memorandum of Understanding with the Joint Powers Board in the Bay Area for the design, construction and operation of a maintenance facility in the San Jose area. All intercity cars and locomotives operating on the state-supported *Capitols* and *San Joaquins*, along with the Peninsula Commute Service cars, will be maintained at this modern facility. The total cost of the project is $99.2 million. The state will provide $52 million ($21.9 million in intercity funds) for the project.

The new California Cars and locomotives will also be assigned to operate in Southern California. Amtrak's existing maintenance facility in Los Angeles is in need of major rehabilitation to increase productivity and improve maintenance quality. Caltrans has $12 million in Proposition 108 funds programmed for FY 1994-95 to upgrade the existing or future facility in Los Angeles to serve the new equipment and expanded intercity services on the corridor.

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[3] Current service includes the following daily round trip services: nine *San Diegans*, four *San Joaquins*, and three *Capitols*.

IV. CONCLUSION

The following tables summarize the statewide operations, maintenance and rehabilitation needs for the four transportation modes.

TABLE 10. SUMMARY OF STATEWIDE TRANSPORTATION OPERATION AND MAINTENANCE NEEDS

($ in millions)

MODE	EXISTING ANNUAL EXPENDITURES	UNFUNDED ANNUAL NEEDS
HIGHWAYS Maintenance	730.0	45.0
Operations	50.0	75.0
STREETS & ROADS Rural	180.0	180.0
Urban	156.9	80.6
PUBLIC TRANSIT Transit	2,580.7	366.0
Commuter Rail	119.1	0.5
INTERCITY RAIL	33.5	10.0
TOTAL =	3,850.2	757.1

TABLE 11. SUMMARY OF STATEWIDE TRANSPORTATION REHABILITATION NEEDS

($ in millions)

MODE	EXISTING ANNUAL EXPENDITURES	UNFUNDED ANNUAL NEEDS
HIGHWAYS Highways	250.0	100.0
Bridges	50.0	33.0
STREETS & ROADS	590.3	303.4
PUBLIC TRANSIT Transit	833.9	232.0
Commuter Rail	626.1	0.0
BART Seismic	0.0	36.0
INTERCITY RAIL	62.2	45.0
TOTAL =	2,412.5	749.4

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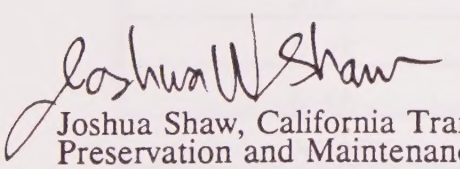

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